

What Is Claimed Is:

1. An optical module,

wherein it is arranged such that one part of light-beams emitted from a laser luminous source is transmitted as a first optical beam through an etalon so as to be introduced into a first optical detection means while at least the other part of said light-beams is introduced into a second optical detection means without being transmitted through the etalon,

wherein the difference between said first and second optical beams is defined as a wavelength error signal, on the basis of the signal an oscillating frequency of the laser luminous source is maintained at a given value, wherein said laser luminous source and etalon are disposed on a substrate,

wherein, by way of the substrate a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively within a given range is provided,

wherein the shortest distance h from a fixed end of the etalon on the substrate to an optical axis of said first luminous flux transmitting through said etalon ranges from one-tenth fold through four fold of what is found by a formula: $1/e^2 \times$ light-beams radius a , in which e indicates natural logarithm and what is found by which formula is a radius obtained by reducing a peak value of a luminous intensity distribution of the laser beams by $1/e^2$.

2. An optical module according to claim 1, wherein said etalon has a rectangular parallelepiped shape and said second flux passes over a surface opposite to a surface of the etalon provided on the substrate, which surface is in contact with said substrate.

5

3. An optical module according to claim 2, wherein said h ranges from one-twentieth through twice of what is found by a formula: $1/e^2 \times$ light-beams radius a, in which e indicates natural logarithm and what is found by which formula is a radius obtained by reducing a peak value of a luminous intensity distribution of the laser beams by $1/e^2$.

10
11
12
13
14
15
16
17

4. An optical module according to claim 2, wherein said h ranges from 3im through 4mm.

18
19
20

5. An optical module according to claim 2, wherein a height of the etalon disposed on the substrate ranges from one-twentieth through twice of a radius of the first luminous flux.

20

6. An optical module according to claim 2, wherein a height of the etalon disposed on the substrate ranges from 3 micron through 4mm.

25

7. An optical module according to claim 1, wherein said substrate has a convex portion, on which portion the etalon is

provided, and the said laser luminous source is provided via a plate on the substrate except for said convex portion.

8. An optical module according to claim 1, wherein a cover
5 is provided on the substrate such that said cover bridges over
the etalon.

9. An optical module according to claim 8, wherein said cover is intended for approaching a temperature of said etalon to that of the substrate, and wherein the cover is brought into contact with both the substrate and the etalon.

10. An optical module according to claim 8, wherein an aperture is provided with said cover so as to enable said first and second luminous fluxes to reach the first and second optical detection means.

11. An optical module according to claim 1, wherein the
light-beams emitted from the luminous source is divided into
20 more than two parts so as to obtain first and second luminous
fluxes.

12. An optical module according to claim 1, wherein one part
of said light-beams that comprises luminous flux to substantially
run parallelwise is defined as a first luminous flux while at

least the other part thereof is defined as a second luminous flux.

13. An optical module according to claim 1, wherein said etalon
5 has a rectangular parallelepiped shape, and said second luminous
flux passes along a surface adjacent to a surface of the etalon
provided on the substrate, and wherein the surface is in contact
with the substrate.

14. An optical module according to claim 13, wherein a height of the etalon provided on the substrate ranges from one-twentieth through four-fold of a radius of said first luminous flux.

15. An optical module according to claim 13, wherein a height of the etalon provided on the substrate ranges from 3 micron through 4mm.

16. An optical module, wherein it is arranged such that one part of light-beams emitted from a laser luminous source is transmitted as a first luminous flux through an etalon so as to be introduced into a first optical detection means while at least the other part of said light-beams is transmitted through the etalon so as to be introduced into a second optical detection means and that there is a difference within the etalon between an optical path length

of the first luminous flux and the length of the second luminous flux,

wherein the difference between said first and second fluxes is defined as a wavelength error signal, on the basis of the 5 signal an oscillating frequency of the laser luminous source is maintained at a given value,

wherein said laser luminous source and etalon are disposed on a substrate, by way of the substrate a temperature control means for controlling a temperature of the etalon and the laser luminous source, respectively within a given range is provided,

wherein the shortest distance h from a fixed end of the etalon on the substrate to an optical axis of said first luminous flux transmitting through said etalon ranges from one-tenth fold through four fold of what is found by a formula: $1/e^2 \times$ light-beams radius a , in which e indicates natural logarithm and what is found by which formula is a radius obtained by reducing a peak value of a luminous intensity distribution of the laser beams by $1/e^2$.

20 17. An optical module according to claim 16, wherein said etalon is divided into a first etalon and a second etalon, and wherein through the first etalon the first luminous flux passes while through the second etalon the second luminous flux passes.

25 18. An optical module according to claim 16, wherein said h

ranges from 3 micron through 4mm.

19. An optical module according to claim 16, wherein the etalon disposed on the substrate has a rectangular parallelepiped shape, 5 a height of the etalon ranges from one-twentieth through four fold of a radius of the first luminous flux.

20. An optical module according to claim 16, wherein the etalon disposed on the substrate has a rectangular parallelepiped shape, a height of which etalon ranges from 3 micron through 4mm.

21. An optical module according to claim 16, wherein said substrate is provided with a convex portion, on which portion the etalon is provided, and except for the convex portion said laser luminous source is provided on the substrate via a table.

22. An optical module according to claim 16, wherein a cover is provided on the substrate such that said cover bridges over said etalon.

20

23. An optical module according to claim 22, wherein said cover is intended for approaching a temperature of said etalon to that of the substrate, wherein the cover is brought into contact with both the substrate and the etalon.

25

0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
420
430
440
450
460
470
480
490
500
510
520
530
540
550
560
570
580
590
600
610
620
630
640
650
660
670
680
690
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900
910
920
930
940
950
960
970
980
990
1000

24. An optical module according to claim 22, wherein an aperture is provided with said cover so as to enable said first and second luminous fluxes to reach the first and second optical detection means.